

Remarks

I. Status of claims

Claims 1-28 were pending.

Withdrawn claims 26-28 have been canceled without prejudice.

Claims 29-31 have been added.

The Examiner has indicated that claims 5, 6, 9-15, and 21-24 would be allowable if rewritten in independent form.

II. Claim rejections under 35 U.S.C. § 112

The Examiner has rejected claims 1-25 under 35 U.S.C. § 112, second paragraph, as being indefinite.

The general rule is that if the claims, read in light of the specification, reasonably apprise one of ordinary skill in the art of the use and scope of the invention, the claims are definite and satisfy the § 112, second paragraph, requirement of particularly pointing out and distinctly claiming the subject matter which applicants regard as their invention. Regarding the Examiner's burden in this regard, the Board has stated that:

In rejecting a claim under the second paragraph of 35 U.S.C. 112, it is incumbent on the examiner to establish that one of ordinary skill in the pertinent art, when reading the claims in light of the supporting specification, would not have been able to ascertain with a reasonable degree of precision and particularity the particular area set out and circumscribed by the claims.¹

With respect to independent claim 1, the Examiner has stated that:

Regarding claim 1, the phrase "removing organic components" renders the claim indefinite because it is unclear whether the removal step is limited to only organic material in the polymer without removing the payload moiety or both.

In pertinent part, claim 1 recites "removing organic components of the patterned film to form a payload-comprising nanoparticle." When reading this claim language in light of

¹ *Ex parte* Wu, 10 USPQ 2d 2031, 2033 (B.P.A.I. 1989) (emphasis added) (citing *In re Moore*, 439 F.2d 1232, 169 USPQ 236 (C.C.P.A. 1971).

the supporting specification, one of ordinary skill in the art would have been able to ascertain with a reasonable degree of precision and particularity the particular area set out and circumscribed by the claim. There is nothing unclear about this language of claim 1. This claim language clearly calls for removing organic components of the patterned film in a way that forms a nanoparticle that comprises the payload.

The basis for the Examiner's rejection of claim 1 (i.e., "whether the removal step is limited to only organic material in the polymer without removing the payload moiety or both") does not have anything to do with the clarity of the claim language, but rather concerns the breadth of the claim. It is well-settled, however, that applicants are entitled to claims that are as broad as the prior art and the application disclosure will allow. It is improper for the examiner to equate the breadth of the claims with indefiniteness. If the scope of the claims is clear, the claims comply with § 112, second paragraph. In addition, the absence of a specific feature recited in the specification does not make a claim indefinite.

For these reasons, the Examiner's rejection of claim 1 under 35 U.S.C. § 112, second paragraph, should be withdrawn.

With respect to independent claim 25, the Examiner has stated that:

As to claim 25, similar analysis applied as discussed above and also note that the term "components" recited in line 8 is not clear that the components are directed to the organic components, which are removed in line 6 or the payload moiety.

It is further noted that in claim 25, line 6, the phrase "removing organic components of the patterned film to form respective nanoparticles" renders the claim indefinite because it is unclear whether the formation of the nanoparticles in relation to the patterns or with the removal of the organic components.

In pertinent part, claim 25 recites "removing organic components of the patterned film to form respective nanoparticles comprising an average number of payload-moiety-comprising components substantially equal to the number of payload-moiety-comprising repeat units in the vector polymer." When reading this claim language in light of the supporting specification, one of ordinary skill in the art would have been able to ascertain with a reasonable degree of precision and particularity the particular area set out and circumscribed by the claim. There is nothing unclear about this language of claim 25. This claim language clearly calls for removing organic components of the patterned film in a way

that forms nanoparticles that comprise an average number of payload-moiety-comprising components substantially equal to the number of payload-moiety-comprising repeat units in the vector polymer.

The Examiner's first basis for rejecting claim 25 appears to be premised on a misreading of lines 6 and 8 of claim 25. In particular, claim 25 does not recite that the components in line 8 "are directed to" the components that are recited in line 6, as proposed by the Examiner. Instead, the "components" recited in line 6 are "organic components of the patterned film" that are removed, whereas the "components" recited in line 8 are "payload-moiety-comprising components" of the nanoparticles that are formed by removing organic components of the patterned film. This basis for rejecting claim 25 does not have anything to do with the clarity of the claim language, but instead impermissibly concerns the breadth of the claim.

Similarly, the Examiner's second basis for rejecting claim 25 (i.e., "whether the formation of the nanoparticles in relation to the patterns or with the removal of the organic components") does not have anything to do with the clarity of the claim language, but rather concerns the breadth of the claim. As explained above, it is well-settled that applicants are entitled to claims that are as broad as the prior art and the application disclosure will allow. It is improper for the Examiner to equate the breadth of the claims with indefiniteness. If the scope of the claims is clear, the claims comply with § 112, second paragraph. In addition, the absence of a specific feature recited in the specification does not make a claim indefinite.

For these reasons, the Examiner's rejection of claim 25 under 35 U.S.C. § 112, second paragraph, should be withdrawn.

III. Claim rejections under 35 U.S.C. § 103

The Examiner has rejected claims 1-4, 7-8, 16-20, and 25 under 35 U.S.C. § 103(a) over Choi (U.S. 2001/0006851) in view of Wang (U.S. 2005/0084613).

For the purpose of the following discussion, the Examiner is reminded that:

To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the

patentability of that claim against the prior art." In re Wilson,
424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

MPEP § 2143.03.

A. Independent claim 1

Claim 1 recites:

Claim 1 (original): A nanostructure fabrication method,
comprising:

forming on a substrate a film including a vector
polymer comprising a payload moiety;

patterning the film; and

removing organic components of the patterned film to
form a payload-comprising nanoparticle.

Regarding claim 1, the Examiner has stated that:

Choi et al disclose a process of forming nano-sized surface
features on a substrate, wherein the process including the steps
of forming a polymeric layer on a substrate and etching or
patterning the polymer layer using oxygen plasma through a
photoresist masking layer (abstract, paragraph 0009).

Choi et al fail to teach the polymer layer comprises a vector
polymer comprising a payload moiety.

However, Wang et al teach a process of forming nanopattern on
a substrate, wherein coating a polymer layer comprising
organic moiety such as acrylate and inorganic composites such
as silicon, aluminum or other metallic composite (see
paragraph 0025).

Wang et al also teach that such polymeric layer will provide
improved nano patterning due to the improved characteristics
of the polymeric material such as maintaining desired pattern
shape during the transformation of the polymeric material (see
paragraphs 0008-0009).

Therefore, it would have been obvious to one of ordinary
skilled in the art at the time of claimed invention to modify
Choi et al's polymeric film with Wang et al's teaching for
maintaining the desired pattern in order to form improved
nano-sized structure as taught by Wang et al.

In his rejection of claim 1, the Examiner has not shown that Choi and Wang, either taken alone or in combination, teach or suggest “removing organic components of the patterned film to form a payload-comprising nanoparticle,” as recited in claim 1. Indeed, the Examiner merely has asserted that Choi teaches “forming nano-sized surface features” and that Wang teaches “forming a nanopattern on a substrate.” Neither the nano-sized surface features described in Choi nor the nanopatterns disclosed in Wang, however, constitute a nanoparticle. Nowhere in his rejection of claim 1 does the Examiner attempt to show that the disclosures of Choi and Wang would have motivated one skilled in the art at the time the invention was made to form a payload-comprising nanoparticle as recited in claim 1.

Thus, the Examiner impermissibly has failed to consider all of the words in independent claim 1 and therefore has failed to establish a proper *prima facie* case of obviousness. For at least this reason, the Examiner’s rejection of independent claim 1 under 35 U.S.C. § 103(a) over Choi and Wang should be withdrawn.

In addition, in accordance with Choi’s teachings, all traces of the carbon polymer layer 4 are etched away in the process of transferring the “grass-like structure” from the carbon polymer layer 4 to the surface of the target layer 2 (see ¶ 27 and FIGS. 7A and 7B). That is, the resulting nano-sized surface features of the target layer 2 do not include any moieties of the carbon polymer layer 4. Therefore, the Examiner’s proposal to use one of the films described in ¶ 25 of Wang in Choi’s method would not result in the formation of a payload-comprising nanoparticle, as recited in claim 1. For this additional reason, the Examiner’s rejection of claim 1 under 35 U.S.C. § 103(a) over Choi and Wang should be withdrawn.

B. Claims 2-4, 7, 8, and 16-20

Each of claims 2-4, 7, 8, and 16-20 incorporates the features of independent claim 1 and therefore is patentable over Choi and Wang for at least the same reasons explained above. Claims 17-19 are patentable over Choi and Wang for the following additional reasons.

Claim 17 recites that “patterning the film comprises applying a photoresist over the film, patterning the photoresist, and transferring the photoresist pattern to the film.” The Examiner has failed to address the subject matter of claim 17. Therefore, the Examiner has

failed to establish a proper *prima facie* case of obviousness and his rejection of claim 17 should be withdrawn for at least this reason. Moreover, neither Choi nor Wang teaches or suggests the features of claim 17. Indeed, Choi does not pattern the carbon polymer layer 4 and Wang patterns the film 220 using an imprint mold.

Claim 18 recites “forming a barrier layer between the photoresist and the film.” The Examiner has failed to address the subject matter of claim 18. Therefore, the Examiner has failed to establish a proper *prima facie* case of obviousness and his rejection of claim 18 should be withdrawn for at least this reason. Moreover, neither Choi nor Wang teaches or suggests the features of claim 18.

Claim 19 recites “reflowing the patterned film by heating the patterned film to a temperature above a glass transition temperature of a component of the patterned film.” The Examiner has failed to address the subject matter of claim 19. Therefore, the Examiner has failed to establish a proper *prima facie* case of obviousness and his rejection of claim 19 should be withdrawn for at least this reason. Moreover, neither Choi nor Wang teaches or suggests the features of claim 19.

C. Claim 25

Independent claim 25 includes features that essentially track the pertinent features of independent claim 1 discussed above. Therefore, claim 25 is patentable over Choi and Wang for at least the same reasons explained above in connection with claim 1.

IV. Conclusion

For the reasons explained above, all of the pending claims are now in condition for allowance and should be allowed.

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